

IWTF Projects Update

Inland Waterways Users Board

Meeting No. 79, Paducah, KY

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DIRECTOR, Programs

Great Lakes and Ohio River Division

01 July 2016



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US Army Corps of Engineers
BUILDING STRONG®



Agenda

- Olmsted
- Lower Monongahela
- Kentucky Lock
- Chickamauga Lock
- Upper Ohio Navigation Study
- IWTF project cost data



Olmsted

Bottom Line Up Front

- ✓ Current Schedule: **Ahead of Schedule**
 - 2018 (Project Operational)
 - 2022 (Project Complete)

- ✓ Current Cost: **Under Budget**
 - TEP (\$200M+) – Total Estimated Price
 - TPCS (\$41M) – Total Project Cost Summary

- ✓ Keys:
 1. Receiving **full capability funding** each year has allowed the PDT to efficiently plan and execute our annual work plan.
 2. Advantageous river conditions have allowed the work to expand beyond the contractual low water season (15 Jun – 30 Nov).



2016 Images



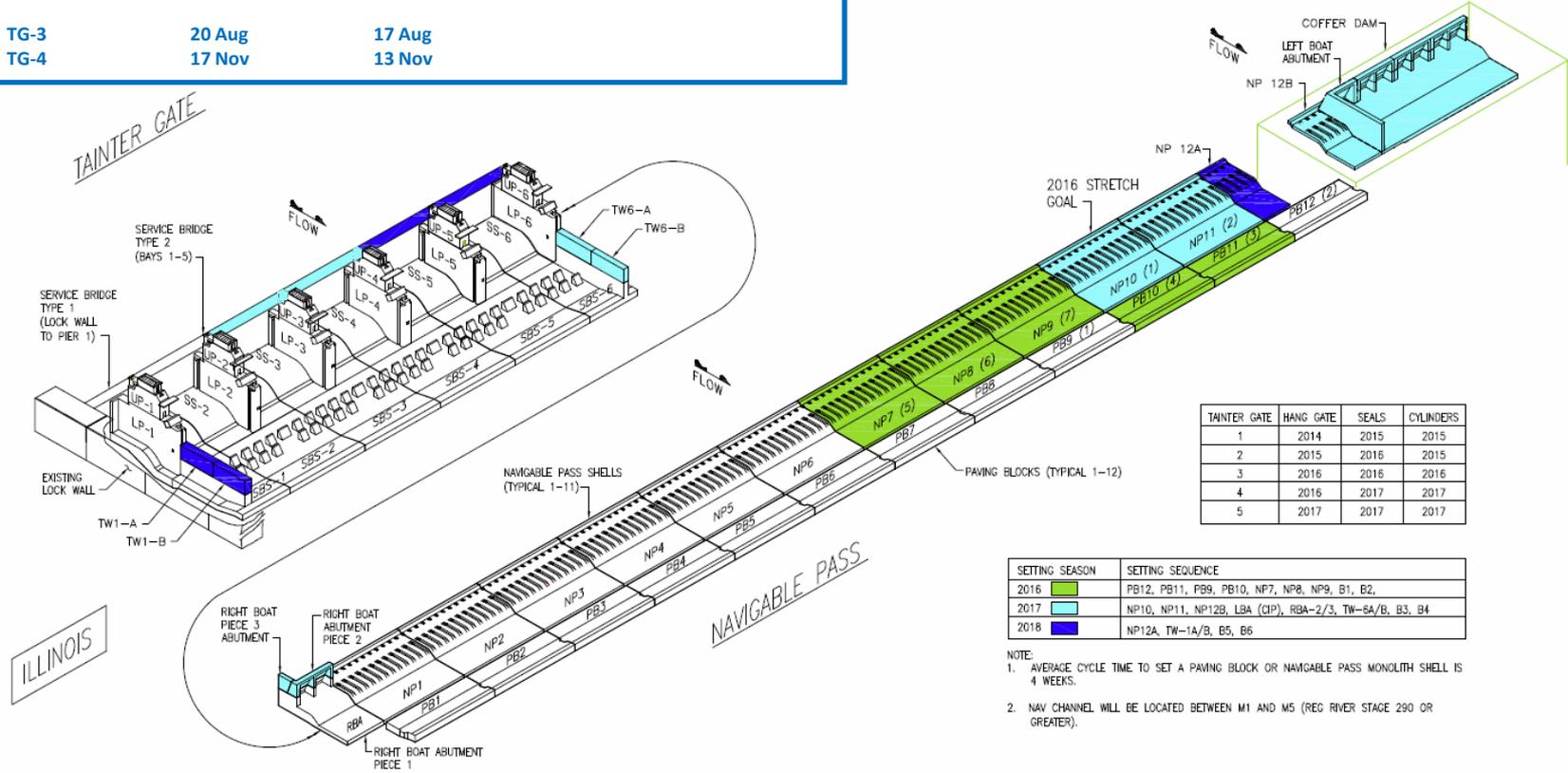
**1. SB-2 Installation 2. Rotary Encoder Factory Test 3. Concrete Placement NP-8
4. PB-12/Lift Frame under CAT Barge 5. Marine Operations 6. CoE (LTG Semonite) Visit**

2016 Plan-to-Complete

	<u>BASELINE</u>	<u>CURRENT</u>
		(FY16-\$268M)
		(FY17-\$225M)
PB-9	26 Jul	19 May (A)
PB-10	17 Aug	23 Jul
PB-11	07 Jul	01 Jul
PB-12	15 Jun	09 Jun (A)
NP-7	17 Sep	12 Aug
NP-8	18 Oct	12 Sep
NP-9	14 Nov	21 Oct
TG-3	20 Aug	17 Aug
TG-4	17 Nov	13 Nov

SHELL SETTING ISOMETRIC

KENTUCKY



Tainter Gate	Hang Gate	Seals	Cylinders
1	2014	2015	2015
2	2015	2016	2015
3	2016	2016	2016
4	2016	2017	2017
5	2017	2017	2017

Setting Season	Setting Sequence
2016	PB12, PB11, PB9, PB10, NP7, NP8, NP9, B1, B2
2017	NP10, NP11, NP12B, LBA (CIP), RBA-2/3, TW-6A/B, B3, B4
2018	NP12A, TW-1A/B, B5, B6

- NOTE:
- AVERAGE CYCLE TIME TO SET A PAVING BLOCK OR NAVIGABLE PASS MONOLITH SHELL IS 4 WEEKS.
 - NAV CHANNEL WILL BE LOCATED BETWEEN M1 AND M5 (REG RIVER STAGE 290 OR GREATER).

ILLINOIS

* Eight shells set in LWS 2015 including one shell set outside historical LWS limits (15 Jun – 30 Nov)



Olmsted Project

Time and Cost Scorecard – April 2016

Expenditures

Planned (BCWS)	\$2.166B
Earned (BCWP)	\$2.074B
Actual (ACWP)	\$2.173B

BCWP: Reports the value (based on % complete) of the work performed to date.

Target:

Actual as compared to Planned: (<1% = Green) (>1%and <3% = Yellow) and (>3% = Red)

Schedule

(PACR)/(Current)

Project Complete	Sep 2024/Mar 2022
Dam Operational	Sep 2020/Oct 2018

Measures: Planned project completion and Dam contract operational dates

Target:

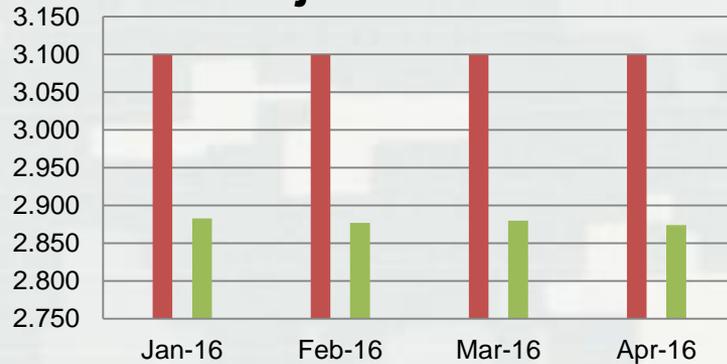
Green: Current = PACR-12 months

Yellow: Current = PACR-11 months to PACR-7 months

Red: Current = PACR-6 months to after PACR date

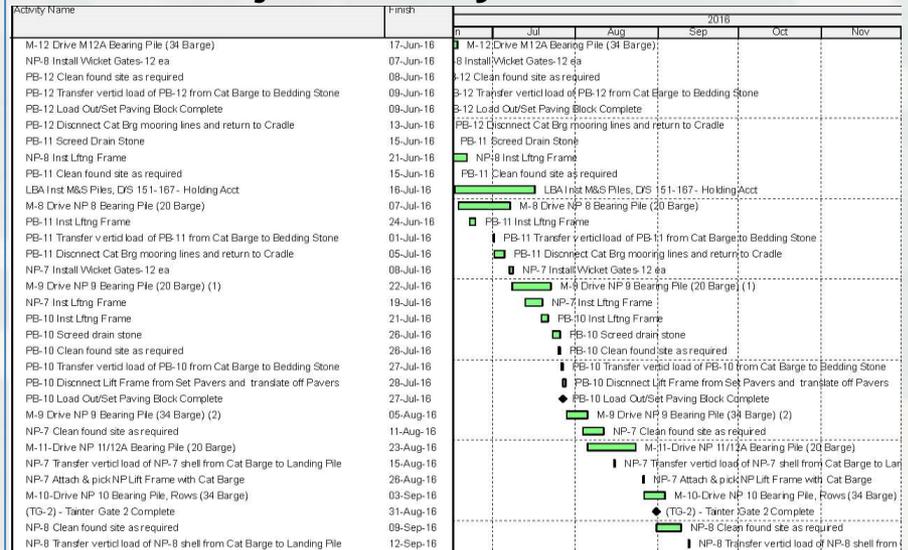
Olmsted Project TEP Trend

TEP in Billions



	Jan-16	Feb-16	Mar-16	Apr-16
■ PACR w/risk	3.099	3.099	3.099	3.099
■ COE TEP	2.883	2.877	2.880	2.874

Major Activity Schedule



Discussion



Olmsted Locks and Dam
Wicket Lifter Barge

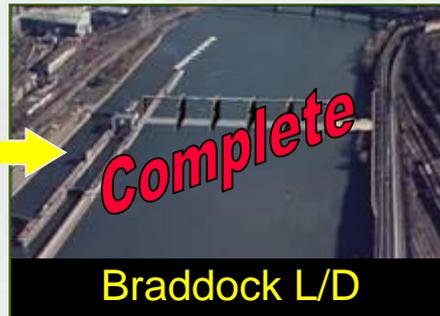
Army Strong
Building Strong
Finishing Strong



Lower Mon - Project Overview

Pre-Project Condition

Post-Project Condition



Major Project Features

- New Dam at Braddock
- New Locks at Charleroi
- Dredging
- Removal of Locks and Dam 3
- Relocations

Financial

- 902 Limit: \$1.76 Billion
- Current Estimate at Completion \$1.2 Billion, including contingencies

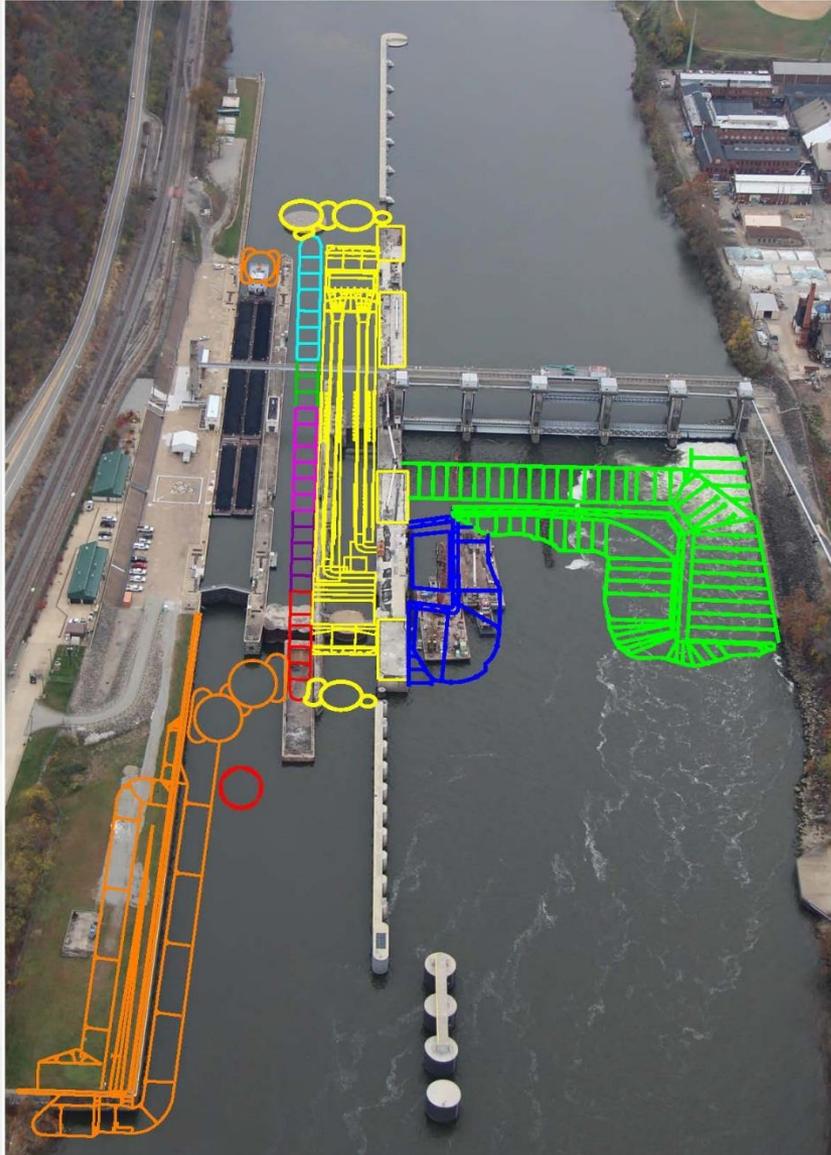


Lower Mon - Project Schedule

Major Feature Construction	Last Reported Completion (April 2016)	Revised (with FY17 W.P.)	Revised (no FY17 W.P.)
Charleroi River Wall	FY 2016		<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;"> <p style="color: red; font-weight: bold;">No change from April 2016 IWUB Meeting</p> </div>
Charleroi Dam Emptying Basin	FY 2016 (Actual)		
Charleroi M22-M27	FY 2019		
Charleroi Dam Stilling Basin	FY 2021		
Charleroi River Chamber Completion	FY 2026	FY 2023	
Dredging Pool 3	FY 2026	FY 2022	
Relocations	Variable		
Lock and Dam 3 Removal	FY 2027	FY 2023	



Lower Mon – Charleroi Ongoing / Pending Construction (Plan - Visual)



Description	Last Reported Completion	Current Completion (FY17 Work Plan)	Current Completion (No FY17 Work Plan)	Previously Planned Award	Current Planned Award	Option Expires	% Complete
Emptying Basin		Physically Completed	Physically Completed	Completed		NA	99.9%
M22-M27	2018	2019	2019	Completed		NA	28%
RCC Base	2022	2023	2023	Completed		NA	21%
RCC Opt 1	2022	2023	2027	May16	OBE	30Sep17	NA
RCC Opt 1a	NA	TBD	TBD	NA	Before 30Sep16	30Sep17	NA
RCC Opt 1b	NA	TBD	TBD	NA	May17	30Sep17	NA
RCC Opt 2	2022	2023	2027	Jun17	Jun17	30Sep18	NA
RCC Opt 3	2022	2023	2027	Nov17	Nov17	30Sep18	NA
RCC Opt 4	2022	2023	2027	Dec18	Dec18	31Mar20	NA
RCC Opt 5	2022	2023	2027	Nov20	Nov20	31Mar21	NA
Stilling Basin	2021	2021	2021	Oct 18	Oct 18	NA	NA

Notes:

- **RCC – River Chamber Completion**
- **Dates shown reflect the revised potential early completion which has been adjusted to account for FY16 challenges, 2 REAs, and FY2017 \$0 Budget. Risk informed RCC completion is 2027.**
- **Remaining project features not shown on this slide:**
 - Dredging
 - Pool Clearing
 - Lock and Dam 3 Removal
 - Relocations



Charleroi Construction Images



1 - M22-M27 Contract: Showing shafts, and cofferboxes for M23

2 - RCC Base Contract: Showing a portion of the drilled shafts for monoliths M1 thru M7



Lower Monongahela River Project

Time and Cost Scorecard – Thru Aug 2015



Expenditures

Planned (BCWS)	\$602.0M
Earned (BCWP)	\$599.1M
Actual (ACWP)	\$595.9M

Target: Actual as compared to Planned: (<5% = Green); (>5% and <10% = Yellow); and (>10% = Red)

Values shown reflect project sunk cost of \$550.6M thru FY 2014 and Current data thru **Mar 2016**

CPI=1.01

Schedule

(Baseline)/(Current Early)

Operational (Realize over 90% of project Benefits)	2027 / 2023 *
Operational (Realize over 90% of project Benefits)	2027 / 2027 **
Project Complete	2029 / 2028

* With FY 2017 work plan funding

** Without FY 2017 work plan funding



Estimated Cost at Completion

	>90% benefits
BAC(FF)	\$1.22 B
EAC(FF)	\$1.21 B

Estimated from revised cost and schedule forecast fully funded thru 2029 and estimated costs thru FY 2015, not certified

Reserve Balances (FF): **\$540M**
Project Contingency: \$151M

Sunk Cost (thru Mar 2016): \$ 595.9 M

Contingencies:

Used: \$9.2M (6%)
In process: \$10.8M (7%)
Future Known: \$6.5M (4%)
Total: \$26.5M (17%)

Milestones Status for the Next 6 Months

Pending Approval on FY16 Course of Action:

Concrete Production Obligation:

Drilled Shaft Concrete for M11-M16.

Target award Aug 2016

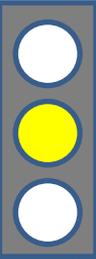
RCC Option 1a:

Drilled shafts & cofferboxes for M11-M16.

Target Award Aug 2016

Concerns

- FY16 funding challenges prohibit award of total RCC Option 1
- FY17 Budget Impacts of FY16 Awards – Assume FY17 Work plan funds



Kentucky Lock Addition Agenda

- **BLUF/Project Overview**
- **Ongoing Construction**
- **Schedule**
- **Challenges**

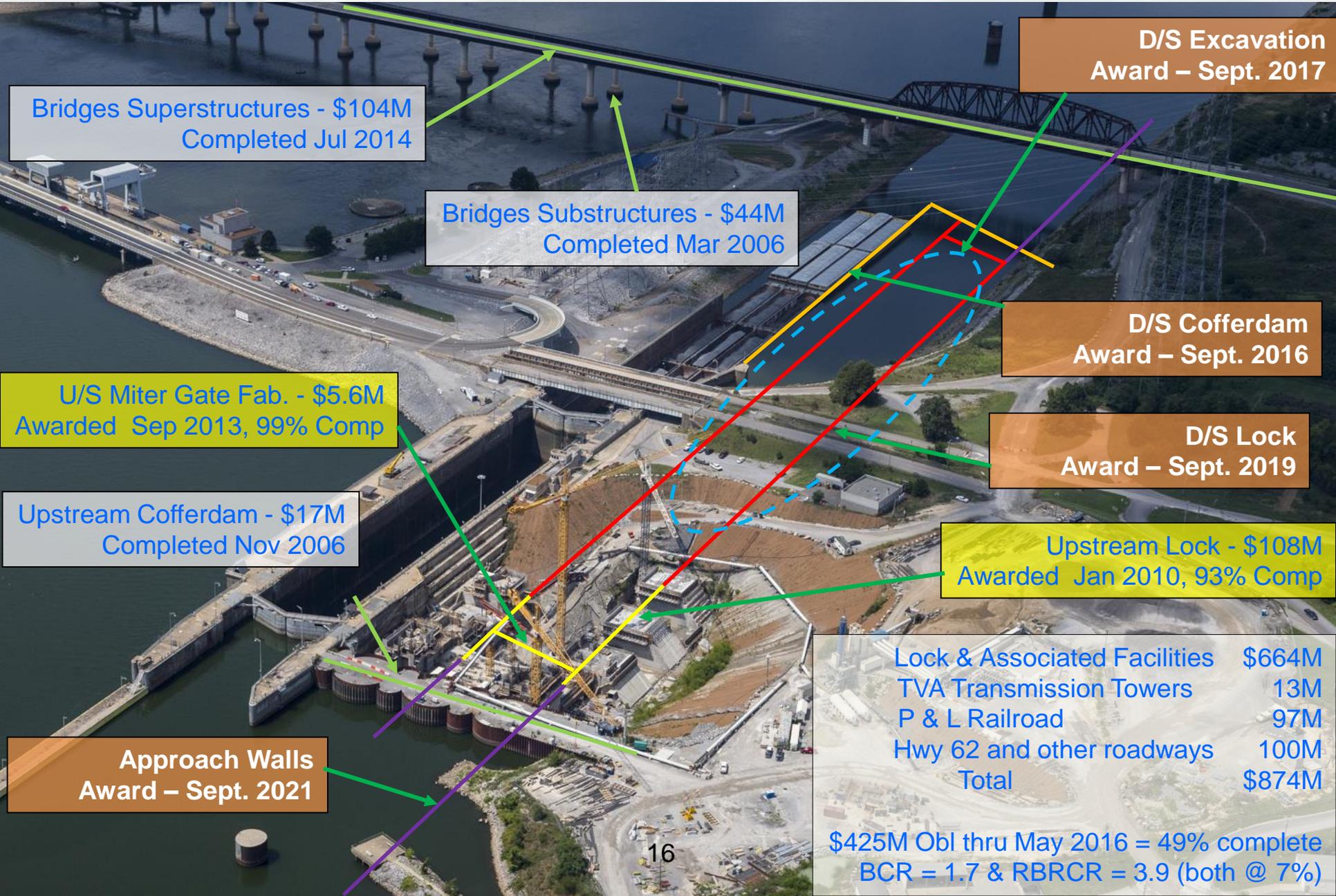


Kentucky Lock Addition BLUF

- **Bottom Line Up Front**
 - ▶ Existing construction is on schedule.
 - ▶ Critical Path Construction will resume with award of Downstream Cofferdam by September.
 - ▶ Construction award schedule has been revised to reflect capability funding.
 - ▶ Traffic levels are healthy
 - ▶ New Risk-Based Total Project Cost Estimate this fall:
 - Cost Estimate will likely increase
 - Current BCR of 1.7 at 7% will likely decrease



Kentucky Lock Project Overview



Bridges Superstructures - \$104M
Completed Jul 2014

Bridges Substructures - \$44M
Completed Mar 2006

D/S Excavation
Award – Sept. 2017

D/S Cofferdam
Award – Sept. 2016

D/S Lock
Award – Sept. 2019

U/S Miter Gate Fab. - \$5.6M
Awarded Sep 2013, 99% Comp

Upstream Cofferdam - \$17M
Completed Nov 2006

Upstream Lock - \$108M
Awarded Jan 2010, 93% Comp

Approach Walls
Award – Sept. 2021

Lock & Associated Facilities	\$664M
TVA Transmission Towers	13M
P & L Railroad	97M
Hwy 62 and other roadways	100M
Total	\$874M

\$425M Obl thru May 2016 = 49% complete
BCR = 1.7 & RBRCR = 3.9 (both @ 7%)



1



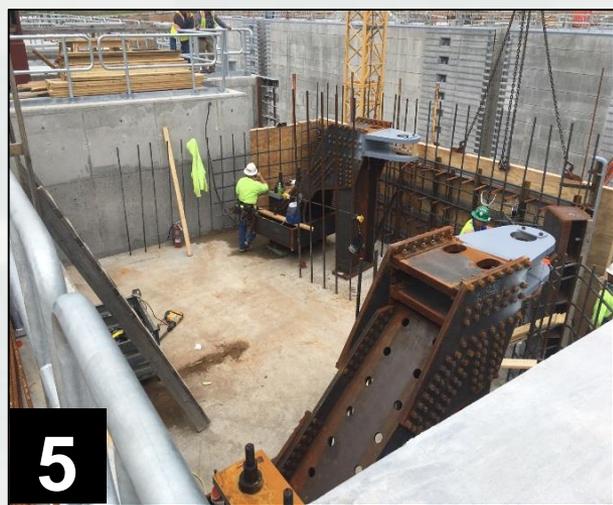
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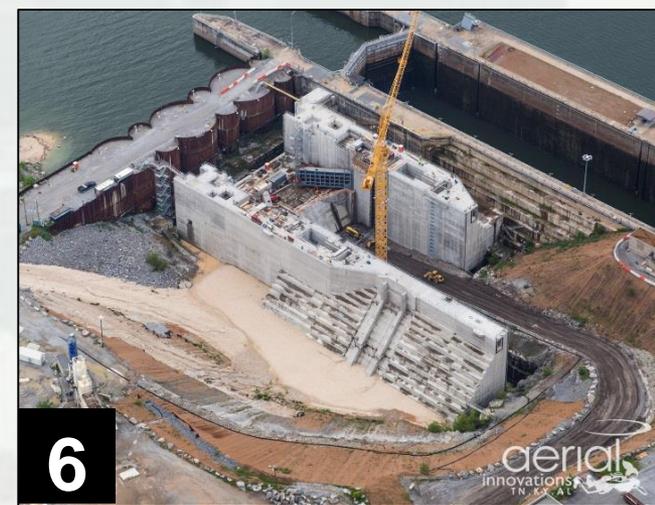
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4



5



6

1. First of 8 sections of Upstream Miter Gate section lifted horizontally 2. Section lifted-in vertical 3. Two sections mated together 4. 6 of 8 sections placed 5. Gate anchorage frame prior to concrete placement 6. Aerial May 2016

Kentucky Lock Project Schedule

Major Feature Construction	Award	Complete ³	Revised
Upstream Lock Monoliths Construction	Jan 2010	Dec 2016	
Downstream Cofferdam Construction ¹	Sep 2016	Sep 2019	
Downstream Lock Excavation Construction	Sep 2017	Mar 2020	
Downstream Lock Construction	Sep 2019	Dec 2023	
Approach Walls Construction	Sep 2021	May 2023	
Risk Based TPCE	Mar 2016	Nov 2016	
Economic Update	Nov 2016	Jul 2017	
PACR for 902 Exceedance ²	Jul 2017	Mar 2018	

¹Contract was advertised on 13 June 2016, bid opening mid-August

²902 Exceedance expected by FY2022

³not risk informed, 80% confidence level schedule available in Nov 2016



Kentucky Lock Summary and Challenges

- Project is ramping up construction to reflect renewed funding.
- Project has adjusted to capability funding
- Recent years average delays >9 hours and CY15 were >14 hours (due to Barkley dewatering)
- New Risk informed estimate will likely increase schedule and budget
- 902 Limit is \$811M vs. current TPCE of \$874M - PACR required



Chickamauga Lock Replacement Agenda

- **BLUF / Project Overview**
- **Construction Photos**
- **Schedule**
- **Challenges**
- **Discussion**



Chickamauga Lock Replacement BLUF

- **Bottom Line Up Front**
 - **Economic and Total Project Cost Updates**
 - TPCCE completed 1 June 2016 - \$755M (Fully Funded, FY17 \$'s, 2023 completion)
 - Econ Update scheduled for July 2016 completion.
 - Current BCR of 1.8 @ 7% will likely decrease
 - Existing construction on schedule
 - Critical Path Construction will resume with Lock Excavation contract award in September.
 - Award schedule has been revised to reflect future funding through “Funding Pots” instead of the President’s Budget.



Chickamauga – Project Overview

Road & Bridges - \$6M
Completed Feb 2007

Lock & Associated Facilities	\$749M
Road and Bridges	6M
Total	\$755M

\$185M Obl thru FY 15 = 24% completed

Lock Excavation
Award scheduled: Sep '16

Bridge Fabrication - \$400K
Completed June 2011

110' x 600' Lock
Award scheduled: Sep '17

Approach Beams - \$14M
Awarded Apr 2010, Comp 2013

Gates & Valves - \$17M
Awarded Sep 2009, Comp 2012

Cofferdam - \$86M
Awarded Sep 2006, Comp 2012

Approach Walls
Award scheduled: Sep '18

Cofferdam Stabilization - \$3.1M
Awarded Sep 2015

Chickamauga Lock Project Schedule

Major Feature Construction	Award	Complete	Revised
Cofferdam Stabilization	Sep 2015	Oct 2016	
Lock Excavation Construction ¹	Sep 2016	Sep 2018	
Lock Construction	Sep 2017	Sep 2022	
Approach Walls Construction	Sep 2018	Jul 2022	
Site Work and Decommission Existing Lock	Jun 2021	Oct 2023	
Risk Based TPCE	Aug 2015	Jun 2016	
Economic Update	Jan 2015	Jul 2016	
PACR for 902 Exceedance ²	Jul 2016	Fall 2016	

¹ Contract bid opening expected mid-August

² 902 Exceedance expected by FY2020



Chickamauga Lock Summary & Challenges

- **Project is ramping up construction to reflect renewed funding.**
- **Project has adjusted to Capability Funding**
- **New Economic Update may result in BCR below 1.0 @ 7% discount rate due to reduced benefits.**
- **902 Limit is \$476M (FY15) vs. current TPCE of \$755M (FY17) - PACR required**



Upper Ohio Nav Study, Project Summary

A condition based study, the feasibility report recommends replacing the three upper most 54' x 360' lock chambers on the Ohio River (Emsworth, Dashields and Montgomery) with 100' x 600' lock chambers.

Current Status

- Supplemental Economic Re-evaluation Report, (Driven by IEPR Comment) completed, reviewed, approved
 - Evaluated longer closure duration (53 and 85 months vs. 12 months)
 - \$2.3B TPC; \$272.5M Incremental Net Benefits (October 2014 Cost Level)
 - BCR now 1.6 to 1; improved from 1.0 to 1 at 7% interest rate
- State & Agency Review currently underway (30 day review period)



Next Steps

- Notice in Federal Register (State and Agency review) began approximately mid June 2016
- Respond to comments received during State & Agency review period
- Cost Certification Update to October 2015 and October 2016 Cost Level
- Chief's Report targeted for signature in Fall 2016



IWTF Project Cost Data

PROJECT	INITIAL BCR @ 7%	CURRENT BCR @ 7%	RBR CR @ 7%	CURRENT BCR @ 3.5% 1/	RBR CR @ 3.5% 1/	TOTAL OBLIGATIONS / ALLOCATIONS THRU FY16	BALANCE TO COMPLETE 2/	TOTAL PROJECT COST - CERTIFIED COST ESTIMATE 3/ & 4/	DATE OF CERTIFIED COST ESTIMATE	NEXT CERTIFIED COST ESTIMATE	ANTICIPATED IMPACT OF NEXT CERTIFIED COST ESTIMATE
Olmsted	2.8 @ 8.750%	3.4 @ 7%	16.3 @ 7%	5.5 @ 3.375%	26.6 @ 3.375%	\$ 2,315,403,000	\$ 743,863,000	\$ 3,059,266,000	Apr-16	TBD	NA
Lower Mon 2,3,4	6.7 @ 7.750%	1.4 @ 7%	2.1 @ 7%	2.6 @ 3.375%	4.0 @ 3.375%	\$ 745,684,000	\$ 474,457,500	\$ 2,733,000,000	Oct-14	3RD Qtr. FY 16	Reduced costs
Kentucky Lock	1.7 @ 7.125%	1.7 @ 7%	3.9 @ 7%	3.3 @ 3.5%	7.2 @ 3.5%	\$ 471,576,001	\$ 402,632,902	No Certified Cost Estimate	N/A	4TH Qtr. FY 16	Increased costs
Chickamauga Lock	2.2 @ 5.625%	1.8 @ 7%	2.8 @ 7%	3.2 @ 3.5%	5.1 @ 3.5%	\$ 215,718,619	\$ 538,959,381	\$ 754,678,000	Jun-16	TBD	NA
1/ USACE current year rate (FY18) is 3.125%. The FY16 rate was 3.5%. FY17 rate is 3.375%.											
2/ LM2,3,4: Remaining balance (forecast) is not certified and it DOES NOT include Port Perry Bridge or the Charleroi Land Chamber.											
3/ Certified Total Project Cost INCLUDES construction of Charleroi Land Chamber AND relocation of Port Perry Bridge.											
4/ Certified Total Project Cost IMPACTS since 31 Mar 16: Olmsted: <u>decrease</u> of \$39.5M; Chick: <u>decrease</u> of \$470.1M.											



IWTF Capability Funding

Division	District	Official Authorization Name	Lock / Dam / Channel	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30
Most Efficient Funding 17 Mar 2016 (Assuming FY17 funding only for Olmsted)																		
LRD	LRL	OLMSTED LOCKS AND DAM	L/D	268.0	225.0	175.0	125.0	100.0	75.0	25.0								
LRD	LRP	LOCKS AND DAMS 2, 3 AND 4, MONONGAHELA RIVER NAVIGATION PROJECT	L/D	58.9	82.7	\$38.0	\$10.0	\$89.0	\$92.0	\$104.5	\$158.5	104.0	4.0	4.0	4.0	4.0		
LRD	LRN	KENTUCKY LOCK ADDITION	L	45.4	31.0	40.5	39.8	51.2	102.1	98.0	56.8	15.4						
LRD	LRN	CHICKAMAUGA LOCK, TN	L	29.9	37.0	98.4	135.1	135.1	124.9	104.5	47.4	23.5						
Totals				402.2	375.7	351.9	309.9	375.3	394.0	332.0	262.7	142.9	4.0	4.0	4.0	4.0	0.0	0.0
		The FY17 PB has zero funding for Chick, KY and Lower Mon in FY17																

